THE EDUCATOR.

"Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge."—WASHINGTON.

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BIOGRAPHICAL SKETCH.

OF V. J. DUVAL.

(Concluded from our last.)

"As I was every Sunday accustomed to go to hear mass at the church of the Carmelites at Luneville, I took it into my head to go into the garden belonging to the convent, where I perceived Mr. Remy, who had the direction of it, seated at the head of one of the walks with a book in his hand, which was the method of studying geography by Sieur Delaunay. I entreated Mr. Remy to lend it me, which he very kindly did. I proposed to copy it, but my impatience to know its contents made me look over it as I passed through the walks, and before I arrived home I had learned the reduction of degrees in the equator to the different measures employed by different nations. It was then that I perceived the real littleness of our globe in comparison of the expanse of space, with which my imagination was forcibly struck." Duval relates pretty fully the steps which he took in his studies, and the obstacles which he had to surmount, without a guide and almost without books. His want of books was his greatest uneasiness. The zeal and industry he employed to vanquish the difficulties he had to encounter, he states in the following words:

"Passionately fond of geography," continues he, "I never slept without dreaming of it, and in want of every thing that could assist my researches, I determined to invent some means by which my circumstances might be improved. For this purpose I performed the part of another Acteon, and declared war against all the beast of the forest, for no other purpose than to profit by their spoils, in order to purchase for myself maps and books. I hunted foxes, polecats, &c., and sold their skins to a currier at Luneville. Several hares were also silly enough to fall into the snares I had laid for them, and the birds likewise contributed to my instruction by the loss of their liberty; so that, in a few months, my industry procured me between thirty and forty crowns. I went, or rather ran to Nancy, to buy books with that sum. A translation of Pliny's Natural History, of Livy, the History of the Incas of Peru, and of the cruelties exercised in America by the Spaniards: also, Bartholemy-de-las-Casas, the letters of Bussi Rabutin, the Characters of Theophrastus, the Political Testament of Louvois, the Fables of the ingenious La Fontain, and some other works; with several geographical maps, which exhausted my finances and my credit; I say my credit, for not having sufficient to pay for all that I have specified, the good man Truain my bookseller, without ever having seen me before, or knowing any thing of me, admitted me, contrary to my own wishes, among the number of his debtors, to the amount of between twenty and thirty francs. Having asked him upon what he founded such confidence; 'Upon your countenance,' said he, 'and your ardour for study I read in your features that you will not deceive me.' Though this good opinion had been built on so very equivocal a foundation, yet I felt greatly obliged to him, and said that I would do my utmost to justify the confidence with which he had honored me.

"Bending under the load of my scientific bundle, I walked five leagues to regain my solitude, not without much fatigue, and stoping more than once by the way. My cell now became a little world to me; its walls were hung round with kingdoms and provinces; and being very small, I tied the planisphere to the top of my bed, so that I could not awake without casting my eyes upon it."

His industry and ardour for instruction is so interesting, that it must create a wish to hear of his endeavours being crowned with success. A fortunate circumstance took place, which augmented the little treasures of Duval. He found a gold seal, engraved with a coat of arms, and caused it to be announced in the church. An Englishman came to reclaim it; "If it be yours," said Duval, "be so obliging as to explain the meaning of the arms on the seal." "You jest, young man," replied he, with surprise; "the arms in all probability, are beyond your comprehension." "It may be so," replied Duval, "but I declare to you, that unless you explain the arms you shall not have the seal." The Englishman obeyed; and conceiving the highest opinion of the young man, asked him many questions, and invited him to come and see him. By his generosity the library of Duval was augmented to one hundred volumes; but his wardrobe still continued the same. A smock frock of woollen cloth, and a pair of wooden shoes, composed all his dress.

The instruction which he had now acquired disgusted him with his situation, and he began to think of escaping from it, when an unexpected event took place which changed the course of his destination. The wood where he fed his cows, as we before remarked, was generally his closet for study. One day when he was there, surrounded with maps, he was accosted by a gentleman, who, surprised at his appearance, asked him what he was doing? "I am studying geography," replied he. "Do you understand any thing about it?" said the stranger. "Why," replied Duval, "I never employ myself in what I do not understand.' 'In what part are you presently occupied?" "I am seeking the road to Quebec, as I wish to continue my studies in the university of that town;" for he had read of a famous university being at that place. "There are," replied the stranger, "other universities more suitable for you;—I will direct you to one."

During their conversation several gentlemen coming up, who proved to be the young princes of Lorraine, they proposed that he should complete his studies with the Jesuits at Pont-a-Mousson. Duval hesitated:—his studies were dear to him—but his liberty was still more precious, and he accepted it on condition that he should preserve his freedom. His progress here was so rapid, that after two years, Duke Leopold, who wished to attach him to himself, made him take several journeys. Among others, he sent him to Paris, and upon his return, made him his Librarian, and Professor of History, in the academy at Luneville. This, with the private lessons he gave to the English, procured him the means of purchasing and rebuilding the cottage where he was born, and which his sister had sold from indigence. In its place he built a small neat house which he gave to the village to lodge their schoolmaster in. He made an excellent use of his newly acquired fortune, for his inclinations were naturally beneficient. One day in passing through a little hamlet, he asked for a glass of water to refresh himself; which, after waiting a long time he at last got in a wooden bowl. They excused themselves by saying, that they had more than a mile and a half to fetch the water, as there was neither a well nor a fountain in all the village.—He felt for the misery of these poor creatures and gave them four hundred francs to enable them to dig a well. This good man became at length Librarian to the Emperor of Germany; and died honoured by all who knew him, in 1778, aged eighty years.

We copy the following interesting extract from an article in the February No. of the "Annals of Education". Will the Legislature of Republican Pennsylvania do less for the instruction of her citizens in the useful arts and sciences, (we dont want the Cavalry, Infantry and Artillery) than the Despot of Egypt? We think not. Time will shew it.

The present position of Egypt is not without peculiar and even romantic interest. The date of her origin is lost in the obscurity of tradition. The traces of her high refinement are already found in the earliest authentic history. The government was fully organized, with settled divisions of office and forms of justice, and the riches of the country developed in the days of Abraham. She was the mother of arts and sciences and of

civilization in Europe. For centuries has her power been feared, and for decades of centuries have her riches been coveted. Her pyramids and temples remain for the wonder of the world; but the power of her priesthood, the genius of her people, and the wise and stable order of her administration are gone. The world has admired and has despised her.

Yet there are tokens, slight and uncertain indeed, that Egypt may recover from this long degeneracy. This hope lies not in the energy of the people, but in the singular personal character of Mahomed Ali the reigning Pacha. As the eyes of Europe are turned with interest to the career of this extraordinary man, and men are anxiously watching the character and waiting for the results of his movements, we have thought a slight notice of his history would not be unacceptable to our readers, nor an unapt introduction to a statement of his labors for education.

Mahomed Ali was born in Cavalla, a small town of Roumelia, a district of Albania. By his vigilance, resoluteness and promptness of action, he gained the appointment of subordinate collector of taxes in that place, an office allowing, and perhaps, in customary discharge of it, requiring fearlessness and cruelty. Here he married a relation of the governor and became a dealer in tobacco. When the French invaded Egypt in 1798 he was sent with 300 men to join the opposing army. After the treacherous murder of the Mamolouks, he obtained the command of a division under Yousef Bey in the expedition against them in Upper Egypt. Being in danger from some alleged misconduct in this campaign, he combined with a rival to overthrow the administration, and the power reverted to the Mamelouks. In several changes which followed he became an object of attention at Constantinople, and wss appointed Pacha of Djidda and Mecca in 1804.—Before he could enter on this office he was, doubtless at his own instigation, proclaimed Pacha of Egypt by the army under his command and after some struggles with the rival Beys and with the Sultan, was fully recognized by the latter in that capacity. In 1807, he utterly defeated an English invading army under General Fraser. In 1811, he most perfidiously and cruelly murdered several hundred of the Mamelouk chiefs. Till 1815 he was occupied in war with the Wakabees in Arabia. This war was renewed in 1824 and lasted several years.

At present the dependence of Mahomed Ali on the Sultan seems to be nominal. He has been recently at war with the Porte and has conquered Syria, which he now holds. He is now about 70 years of age. There is yet an uncertainty who will be his successor, and a fear may be entertained that his plans will die with him, and Egypt revert to her former subjection and cruel oppression.

The present viceroy has made great changes in the arts and habits of the people, as well as in the spirit of the government. He has assumed the proprietorship of almost all the land of Egypt. He is the principal trader of the country. Those who are yet permitted to hold lands may sell nothing till the agents of the Pacha have bought what they please at their own price. The population of Egypt is about 3,000,000, and the revenue nearly £20,000,000. The commerce of the country does not exceed £10,000,000, and the manufactures are recent and introduced by the viceroy. He has been at great pains to learn and use every recent improvement in the arts in Europe. He has constructed a canal from Alexandria to the Nile, 48 miles long, 90 feet broad and 18 deep- 250,000 men it is said were employed at once on this work and it was finished in six weeks. The culture and manufacture of cotton have been greatly encouraged. The soldiers are armed and disciplined after the fashion of Europe. This attempt nearly cost the Pacha his life. The army numbers nearly 160,000 men. Cannon are cast, powder manufactured, the steam engine used in Cairo. The changes in Egypt are a remarkable illustration of what the genius of one man can effect. Whether this genius has been influenced by motives of patriotism may well be questioned; whether what of good there is in his labors shall survive him is a problem which time only can solve.

EDUCATION IN EGYPT.

It is to his Highness Mahomed Ali Pacha that Egypt owes the introduction not only of special, but also of elementary education. The following is the plan of public instruction. There are 50 primary schools, of which there are

3 at Cairo, of	600	scholars,
1 at Alexandria, of	200	"
1 at Sious, of	200	"
45 at other towns of the provinces, composed of each 100 scholars,	4500	"
Total,	5500	

They are taught reading and writing, Arabic, and the four rules of arithmetic. These schools after three years study, supply scholars to the two preparatory schools,

1 at Abouzabel,	1500	scholars,
1 at Alexandria,	800	"
Total	2300	

In these two schools are taught Arabic, Persian Turkish and a complete course of arithmetic, the elements of geometry and algebra, history and drawing. These last schools supply, after four years' study, scholars for the special schools which are ten in number as follows:—

The School of Medicine,	300	scholars.
" of Veterinary Surgery,	120	"
" for Cavalry,	300	"
" for Artillery,	300	"
" for Infantry,	800	"
" the Polytechnic,	225	"
" of Languages,	155	"
" of Music,	150	"
" of Agriculture,	50	"
" of Midwifery, which used to be 100,	20	"
Total	2,415	

Total of Special,	2,415
" of Preparatory schools,	2,300
" Primary,	5,500
Grand Total,	10,215

All these schools are furnished with Professors, European and native. The duration of the studies varies from three to five years. The scholars of all these schools are lodged in barracks, and subject to military discipline; they are clothed, fed, and paid by his Highness. The scholars receive monthly

	Year 1st.	2d.	3d.	4th.	5th.	
Primary schools,	8	10	12			piastres
Preparatory "	15	20	25	30		"
Special "	40	50	60	70	80	"

Of these schools certain of the distinguished boys are made corporals, serjeant and serjeant-majors; these first, receive five piastres, the second ten, and the third, fifteen piastres a month extra.

Besides these schools, which compose the regular system of public instruction, there are regimental schools for the soldiers, and schools attached to the mosques, which last amount, at least, from 4,000 to 5,000 more in Cairo; and the total number of scholars at the mosques, also throughout all the provinces, amount to 15,000 more. Besides all these schools under the administration of His Highness, there have been formed private establishments, directed by Europeans, for the purpose of disseminating education among the population, without reference to religion or nation.

The following extract is from the Editorial, of Horace Mann, Esq. Editor of the Massachusetts Common School Journal and General Agent of the Board of Education.

MORAL AND RELIGIOUS EDUCATION.

On these momentous subjects, we can hardly say anything, beyond what is to be found in our Prospectus, without entering fields of thought which it is here impossible to traverse. Yet, on the other hand, it is scarcely possible even to mention so impulsive a theme, without being roused to expressions in attestation of its value. What deep and unfathomable meaning dwells in the words veracity, impartiality, benevolence, justice, duty! Attaching to us in our earliest childhood, following us, through every waking moment of our lives, with the imposition of ever-renewing commands; attaching to us in the narrowness of the domestic circle, yet, as our knowledge and our relations expand to fill up larger and larger circles, fastening new obligations upon us, commensurate with our powers of performance; in this view, the all-enfolding law of morality may seem to be a task and a burden; but when we perceive its consonance to our nature, its pure and inexhaustible rewards for obedience, its power of imparting an all-conquering energy, wherever loftiest efforts are demanded, we must hail its authority as among our highest honor and blessings. For what slaves are they, over whom concience is not supreme! What sovereignty awaits those, who yield submissive to its dictates! Never since the creation of man has there been a nation like ours, so nursed in its infancy by the smiles of Providence, endued with such vigor in the first half century of its being, and made capable in its advancing years at once of rising to such unparallel power, and of making existence so rich a boon to its multitudinous members. For this very reason, debasement would stand in appalling contrast with its early promises; and if, through immorality, it inflicts upon itself suicidal wounds, the pangs of its death-struggle will be terrible in proportion to the vigor of its frame and the tenacity of its young life. It has been well said that it took Rome three hundred years to die. Her giant heart still beats, though corruption festered through all her members. Fiercer will be the throes and deeper the shame of this young republic, if in the bright morning of its days, and enriched with all the

beneficence of heaven, it grows wanton in its strength, and, maddening itself with the cup of vice, it perishes basely in sight of its high destiny.

CONCLUSION.

We have sketched an imperfect outline of what a man should do, and what he should not do; so that in educating children they may be prepared to perform the one and discard the other. The great events of life are the consequences which flow from precedent means. If we would have improved men, we must have improved means of educating children. By using the appropriate means, it is perfectly practicable to have a community, whose main body shall march forward in the line of industry, prosperity and uprightness, while a few stragglers only shall leave its compact ranks to enlist under the banners of vice; or by discarding the appropriate means it is perfectly easy to revert this condition, so that the main body of society shall be the abandoned, the sensual, the profligate, with only here and there a heroic exception, fleeing apostate ranks. Of all the means in our possession, the common school has precedence, because of its universality; because it is the only reliance of the vast majority of children; because it gives them the earliest direction, and an impulse whose force is seldom spent until death. Whatever advances the common school, then, will enhance individual and social well being for generations to come. History must be written and read with different emotions of joy or grief, as they rise or decline; and individual minds will bear ineffaceable traces of their good or evil inscriptions. As to every great river, the confluence of a thousand streams is necessary, so every great result is only the sum—the product—the gathering together—of a countless number of minute operations. We would go back, therefore, to the fountain of youth. We would act upon the great truth, which led one of the master painters of Italy to begin, in his art, back at the very grinding and mixing of his paints that no unskilfulness in the preparation of the colours should be found on completion to have marred the beauty or dimmed the clearness of works which were to challenge the admiration of posterity. Hence to improve the places where the business of education is carried on; to better what may be called their outward and material organization; to attend to arrangements merely mechanical; to adapt with a nicer adjustment the the implements and the processes, and to arrange more philosophically the kind and the succession of studies; to increase the qualifications and the rewards of instructors, and to advance them to that social position they deserve to hold; to convince the community that their highest interests are dependent upon the culture of their children,—is the sphere of action to which this periodical is dedicated.

Citizens of Massachusetts,—Will you proffer your aid for the promotion of this object? It appeals to your patriotism. It appeals to your philanthrophy. None of you is so high as not to need the education of the people as a safeguard none of you so low as to be beneath its uplifting power. To be emulous of the good name of your ancestors may be an honor; but to be devoted to welfare of your posterity is a duty.—The one may be founded on selfishness; the other is allied to religion. We invoke your co-operation, not so much for the outward and perishable good of your children, as for their inward and abiding;—not for a temporary object, but for the interminable future. We seek less for their external and mutable interests, than for the establishment of those great principles, which lie under the whole length of existence. Let them be educated to be above pride as well as above abasement; to be the master instead of the slave, of accident and of circumstance; to live less in the region of the senses and appetites, and more in the serener and happier sphere of intellect, of morals and religion. Then, though you leave them no patrimony, they will never be poor;—though temporal adversity befall them, they cannot be deprived of the substantial part of all happiness.

From the Common School Assistant.

When Professor Griscom, that benevolent man and practical philosopher, visited the establishment of Fellenburg, three hundred young men were earnestly listening to a lecture from Vallerie, one of his assistants. Said Fellenburg "Do you see those young men? they are all teachers. If I do but pursue the right course in education, I shall revolutionize Switzerland." What are we doing with this mighty engine? Teachers should constitute a distinct profession of men, just as lawyers and physicians do; and the profession ought to be held in the highest respect—certainly as much as either of the others. What a model of a man ought he to be who is to give character to the minds of our children; It is from him that that influence emanates which is to form and direct their habits of thinking. To him they look up—on him they gaze. He is their model—their oracle. And whatever he may be, that he stamps on them, like the image of the reigning king on the coin of the kingdom. What then, should he be; in what balanced and exact harmony should all his own powers be, who is to give the tone to all these harps of a thousand strings!—a tone which is to remain in the strings for ever!

Another cause of the evil we deplore is in this: a parent sits in his door and sees a stranger enter his gate. The man comes up to him and says, "Sir, do you want to hire a hand?" He replies, "Yes if he suits me; what can you do? Can you mow? Can you cradle? Can you drive a team? Can you thresh? Can you chop?" If he likes the answer, he hires him. Presently another stranger comes to the gate: "Does not your school want to hire a teacher?" "Yes; *how much a month* do you ask?" Observe the different manner in which he is catechised. The parent will look into the qualifications of the man he hires to chop wood, and will look well to him after he is hired; but he will put a man into the school where his children are instructed, without ascertaining what he knows, or whether he can teach, and will never look after him at all for months and years! I once met with a parent—I will not say in what State, lest I should be accused of being personal—who said to me, "Do you really believe that education does any good?" I kept my countenance, and endeavourd by conversation to convince him of its effect upon the mind and on the community. He listened to me patiently, and then replied, "My friend, you have not lived in the world as long as I have. I have found that high-larnt' men do not grow rich. There was my neighbour down the road; he had two sons; one of them he made a lawyer, and another a physician. He has to send the lawyer six hundred dollars a year to support him, and, as to the physician, he is like to go to jail; but he has got another son who can't say his letters, and he is the joy of the old man's heart; he stays at home and works."

How can you deal with such a mind? There is no reasoning with ignorance. Its sphere of vision is so extremely narrow, its whole horizon is so very limited, that you can scarce get room for one idea on which to hang an argument: But the man you cannot argue with, you may sometimes laugh out of error. He will flinch under satire when perfectly obtuse to logic. I said to such a man, suppose you had a blacksmith near you who should set up a sign, "Clocks and Watches Repaired Cheap." You take your watch to him. The blacksmith has heard that watchmakers hammer and bore and pinch the works of watches, and he sets to work and hammers and pinches at the wheels of your time-keeper. You pay him a trifle and get back your watch, but does it keep time? Just such a saving do you make when you hire cheap teachers, who hammer and pinch the children, but know no more of their business than a blacksmith of watchmaking. This was a sort of talk that came home to his mind, and he admitted what I said to be true.

The senior Editor of this paper, enjoyed, on Saturday the 9th inst. the high and honorable satisfaction, of making a speech more that two hours long, to a large collection of practitioners in the primitive art—TERRACULTURE. A full and respectable meeting, was held at Bloomsbury, on the confines of Warren and Hunterdon Counties, N. J. for the purpose of organizing an Agricultural Society. The friends who called this meeting, were pleased to give me the honor of the first speech; for which they have my hearty thanks. Scarcely ever did I speak to a more attentive audience and I fondly hope and firmly believe the farmers assembled, went from that meeting, with a feeling of self respect and a love for their employment greater than they brought with them; and greater than they have done sometimes from the conflicts of party zeal. The organization of "The Musconetcong Agricultural Society" argues well for our neighbors in Jersey. When the men who fill all mouths and keep all stomachs in good humour, begin to appreciate their own worth and influence, not simply by their weight in the ballot box, but by the amount of science which they carry into practice, we may expect to see the soil teeming with richer harvests and society rising in the scale of intelligence and wisdom. Let our farmers only come forward and avail themselves of the science within their reach, and very soon terraculture will be the most honorable, as it is the most useful of all the sciences and arts. When will Old Northampton County awake up!

VIRGINIA.

We have seen an extract from Gov. Campbell's last message to the legislature, which gives a most deplorable picture of the state of education in Virginia. From this it appears, that of the white male population arrived at the age of puberty, very nearly *one fourth* are unable to read and write. A much greater proportion of the female population is supposed to be in the same predicament. But what is quite discouraging to the adoption of a Common School System like that which Governor Campbell recommends, is the statement, that one fifth of the white families of Virginia are so extremely poor as to be unable to contribute any thing towards the education of their children.

Let every farmer who has a son to educate, believe and remember, that science lays the foundation of every thing valuable in agriculture.

THE EDUCATOR.

EASTON, PA., FEBRUARY 28, 1839.

Two Travelling Agents, one for the Eastern and one for the Western part of the State are much needed, Our paper *must* be more extensively circulated and we *will* give liberal remuneration to suitable persons, if such can be procured. If any are willing let us hear from them.

Stationary Agents to whom payments may be made and through whom papers may be ordered.

Philadelphia—W. S. Martien Esq. South East corner of George and 7th streets.

Harrisburgh—Joseph Wallace Esq.

Sunbury—Rev. W. R. Smith.

Pittsburgh—J. N. Patterson, Bookseller, Wood St.

Cannonsburgh—A. Munro Esq.

Mercer—John Bingham.

New York—Robert Carter, 58 Canal street.

Williamsport—H. C. Piatt.

Eighteenth Annual Report of the Mercantile Library Association Clinton Hall, New York. January 1839.

The success of this Association is a remarkable proof of what may be achieved by union and perseverance. In 1821, when the first annual report was given in, the Library contained about 1000 volumes. At the date of this report, the number of volumes in the Library, was 18,323, the number of members 4527, and the gross receipts of the year, $8072 77.

The plans of the Association have extended with its growing prosperity. The establishment of a Library for that class of young men in New York who are employed in counting-houses and places of business, was the original object of the Founders and Patrons of the Association. In 1830 having entered in the Library and Reading Room, provided for them by the munificence of the Clinton Hall Association, arrangements were made for having Lectures delivered before the Association. During the past year these Lectures have been continued; the formation of a Museum of specimens in Natural Science has been commenced; a numerous class in chemistry has been formed; and instructions have been given in the French, Spanish, and German Languages and in the art of Drawing.

In this report a still farther extension of the objects of the Association is proposed. We would do injustice to this proposal were we to state it in any other language than that of the report.

There is perhaps no single profession which calls into exercise a greater variety and volume of general knowledge, than that of the merchant. The relations, geographical; political, and commercial, of distant nations as well as of his own country; the principles and the systems of political economy and finance; commercial history and commercial law; the properties of natural products and the results of the processes of art—all are intimately connected with the very details of his business, with the routine of his daily thoughts. If he be true, then, to his profession or to his own interests, must he not seek to open to himself every source of valuable practical information? Must he not be eminently desirous to consecrate the studies of his youth and the brief leisure of his maturer years to a specific and systematic preparation for his profession?

Yet what literary or scientific institution in our country opens to the merchant an opportunity of acquiring an education strictly and thoroughly mercantile? What learned body has ever attempted to lay before him, regularly and systematically that general information upon which his success so much depends? Among all the institutions intended to prepare young men for the professions of Theology, Law, and Medicine, where shall we find an institution, directly and fully preparatory to the great profession of Commerce—where shall we look for the Merchants' College? The vast utility of such an institution and the mighty influence which it would exert upon the character of the commercial community are beyond all question. The general enthusiasm with which the means of improvement offered in this Association are seized upon, proves that within these walls, at least, the importance of such an institution is deeply felt.

And such an institution, new in the history of education, we, Fellow Members, hold the power to create. Such an institution, indeed the Merchantile Library Association is already in some degree becoming. The central and commanding position which we occupy among the commercial class in this country: our numerical force; our past and present rapid growth; the variety and extent of our resources, and the general interest with which our movements are regarded; all unite with the wants of our community in calling upon us to present to our members even additional facilties for improvement.

Impressed with these views, and believing them to be the general sentiment of their fellow members, the Board of Directors presented to you, some weeks since, the outlines of a plan to develope more fully and to direct more usefully the great resources of our Association.

They propose, as the basis of the scheme, a course of regular and systematic instruction, by Lectures, in all the principal departments of knowledge most needful to the accomplished merchant. They suppose this may be effected by the engagement of *four competent Professors*, to deliver courses of Lectures upon the following subjects:—

I. The Principles of Commerce, including Commercial Law and Political Economy: which may form the department of one professor.

II. Statistics of Commerce and the Arts, Commercial History and Geography, Agriculture, Mining, &c.; which may form the department of a second professor.

III. Natural Philosophy, including Organic and Inorganic Chemistry, and Natural History in its commercial applications: which may form the department of a third professor.

IV. History, Civil and Literary—Intellectual philosophy, Belles Lettres, &c; which may form the department of a fourth professor.

This plan is worthy of the great mercantile community in which it originates. If carried out in the spirit with which it is proposed it cannot but exert the most beneficial influence on the members of the Association and on society generally. From the early age at which young men are usually apprenticed, their education under the most favorable circumstances is necessarily imperfect. Removed from the parental roof and surrounded by the allurements to pleasure, which abound in every great city, few have moral courage to prosecute in solitude a course of self education. How invaluable to young men, thus circumstanced, the facility of self-improvement furnished by such an Institution as the Mercantile Library Association!

CHRISTIAN PHILANTHROPY.

We extract from the Quarterly Christian Spectator for November 1838, the following account of the exertions of Col. Beckwith a retired British Officer, to promote the cause of Education among the Waldenses. May his example stimulate some of the many among ourselves, to whom God has given wealth, to consecrate it to a similar noble purpose!

The next object of his regard was the erection of a college in which the youth of the Waldenses who seek a liberal education might recieve what may be called a college education. Hitherto they had been compelled to go to Switzerland or France for their entire collegiate and professional education. It was his intention to render it unnecessary for them to go abroad for any thing more than their professional studies. And here we may say, and it is a fact of great interest, that these people have ever highly prized knowledge.—When we were among them we learned that there were then seventeen of their youth at the University of Lausanne, two at Geneva, one or two at Berlin, and we believe, one at Montauban. Besides these, there were seven boys in their own college, which had just been opened, under the instruction of two young professors, who had themselves been taught in the universities of Switzerland. So that not less than thirty youth from this small and oppressed community were actually in various stages of a classical education. As to the college which they have erected amongst themselves, it is a plain, substantial edifice, much like a good New England academy in point of size, built of stone, stuccoed, whitewashed, and covered with slate. It has rooms for various classes, as well as one for a library, and another for philosophical and chemical apparatus. It is a handsome and convenient building. It is intended, that the students shall board in private families in the viliage, where they can live comfortably for a dollar per week if not less.

Another enterprise which this excellent Englishman undertook, and the first indeed, which he accomplished, was to cause to be erected a large school-house in each parish, in a central town or village, for a school of a more elevated description than usual, and which might accommodate a large number of scholars. These schools are all now in operation.

But a far greater enterprise was undertaken by him, which was to have a school-house built in every district throughout the whole territory of the Waldenses. This enterprise is now in progress. The number of school-houses, when all shall have been erected, will be, as Col. Beckwith told us, one hundred and sixty. They are all to be built of stone, plastered outside, white-washed, and covered with slate. They are to be large enough to hold from twenty-five to forty scholars each. Nearly ninety of these school-houses are already built; and the whole will be erected before long. And when the whole one hundred and sixty shall have been built, then, we have no hesitation in saying it, this little community will be better supplied with handsome and convenient school-houses than any spot on this globe, of equal extent, so far as our knowledge extends. As it is, many parts of the country are ornamented with these little white temples, consecrated to teaching "the young idea how to shoot".

And here we ought to state, that in no case has Col. Beckwith carried on his benevolent enterprises at his own sole expense. His plan has always been to propose to the people, that if they

will undertake to accomplish this or that desirable object he will contribute so much towards its accomplishment. This he did in erecting the college, in building the parish school-houses, and in erecting the district school-house. In this way he has secured their interest as well as their cooperation. And although, through the cheapness of labor in that country, these various enterprises have cost far less than they would have cost in almost any other country, yet we speak advisedly when we say that the liberal Colonel has probably paid, or will have paid by the time all is accomplished, at least the sum of twenty thousand dollars!

The next enterprise which this excellent man intends to attempt, if God spare his life, is the establishment of a school or seminary for the education of teachers for the schools throughout the community. This he feels, and justly, to be essential to the success of all the other parts of his educational scheme. When this shall have been accomplished, and when he shall have brought up the people, by his efforts, to sustain these schools, he thinks he will have accomplished all his plans in relation to education. His object is to make this little community a sort of *nursery*, where many youth may grow up like plants, and who, if God should pour out his Spirit upon them, may go forth to flourish in other lands, and especially in France, as ministers of the Gospel, or as useful men in other professions. Could any thing be more beautiful, or more important? Who will not offer a sincere prayer to God for the success of these philanthropic plans and enterprises?

Great Meeting of Citizens friendly to the Culture of Silk.

On Tuesday evening last, in compliance with a public call, an unusually large number of citizens from the city and adjacent districts, assembled in the Hall of the Franklin Institute, to express their views upon the subject of the Culture of Silk, and particularly as to its adaptation to the condition of the poor in this country. The meeting was organized by calling MATHEW CAREY to the chair, and appointing DR. SAMUEL TUCKER, Secretary.

Philip Physick, Esq. opened the proceedings in a brief and lucid statement, concluding by offering the following resolutions, which were unanimously adopted.

Resolved, That this meeting concur in the resolutions passed by the National Convention of Silk growers, held at Baltimore in December last, "that Silk may be grown in all the United States, not only for domestic purposes but as a valuable article of commercial export."

Resolved, That in the opinion of this meeting, experience has demonstrated that the soil and climate of Pennsylvania are better adapted to raising Silk than those of Italy or France.

Resolved, That practical information upon the Culture of Silk, spread among the citizens of our state, is calculated to promote the interests of every class of society.

Resolved, That no project has been started of late years in the United States, so well calculated to ameliorate the condition of the industrious poor, as the culture of Silk.

Resolved, That it is expedient to hold a State Convention in Harisburg, on the 22d of February next, to form a State Society, to consider of and recommend such measure as in their judgement will encourage the growth of Silk in every county in the State, and also to aid the National Silk Society in procuring and diffusing important information throughout the United States.

Resolved, That the friends of Silk culture in every part of the State are invited to attend the Convention as members thereof.

Resolved, That the members of this Convention are requested to devise some plan, whereby philanthropists may establish Mulberry Orchards in the vicinity of our large cities and villages, for the purpose of supplying Mulberry leaves gratuitously to the worthy indigent inhabitants thereof.

Resolved, That the Editors and Publishers throughout the State will confer a public benefit by inserting in their journals the proceedings of this meeting.

An interesting debate was held upon these resolutions, which elicited much eloquence and ability. Messers Israel, Kingsman, Holden, Sargent, Comfort, W. B, Whitecar, Kenderton, Smith, Walker, Dr. Mease, Dr. Emmerson, the Hon. J. B. Sutherland and others addressed the meeting.

The following resolutions were subsequently adopted:

Resolved, That the Silk Journal established by the Convention, held in Baltimore, in December last, and edited by J. S. Skinner, Esq. be and it is hereby reccommended to the patronage of this meeting, and the American public generally.

Resolved, That Delegates in attendance at the Convention to be held at Harrisburg on the 22d of next month, be requested to procure the passage of a law to protect the Mulberry Tree.

Resolved, That a Committee consisting of Dr. Mease, Dr. S. Tucker, Messrs. Kingsman, Comfort, and Cleaveland, be directed to appoint thirty or more delegates from the city and county of Philadelphia to attend the Convention to be held at Harrisburg the 22d of Febrnary next.

Resolved, That the proceedings of this meeting be published in all the daily papers of this city.

MATHEW CAREY, Chairman.

S. TUCKER, Secretary.

Philaaelphia, Jan. 31, 1839.

From Duncan's Sacred Philosophy.

HIBERNATION OF INSECTS.—EGGS.

In attending to the state of animated nature in winter as compared with that of summer, few things are more striking than the almost total disappearance, during the former season, of all the insect tribes. In the warmth and sunshine of the summer months, all nature was instinct with life: and the abundance and variety of the more minute animals, could not fail to attract the observation, and excite the wonder of all who have eyes to see. The bee, the dragon-flythe butterfly, the gnat, and the midge, in all their varieties, myriads of flies of other species, seemed to communicate life and enjoyment to the very air we breathe; while the worm, the beetle, the ant, the caterpillar, the spider, and innumerable other creatures, some of them too minute to be examined without the assistance of art, swarmed on every flower we plucked, and animated the very dust beneath our feet.—Where now is all this busy world? Tribe after tribe, they have vanished from our view; and even in days of balmiest air, and brightest sunshine, we seek for them in vain. Has the breath of winter pierced through their tiny forms, and frozen the current of life at its source? And, if so, by what process of reproduction shall all their various species be reanimated in the returning spring? The inquiry is at once interesting and useful,; and here, again, we shall have occasion to admire the inexhaustible resources of Divine intelligence.

Of some insect families, it is known, that all the individuals are destined to perish before the cold of winter arrives. The natural term of their existence is comprised within the span of a few months; and their periods of youth, of vigor, and of decay, nay, of resuscitation under new forms, and of the various stages of their second or even third state of existence have all been accomplished during the season of genial warmth: so that they naturally cease to exist before the heat which cherished them and the food which sustained them are withdrawn. Their modes of life will more properly form the subject of attention at another season; but at present we have to inquire into the provision of Providence, by which the various species are preserved after the whole race have ceased to live.

As the principle of equivocal generation is nearly exploded from natural history, it will already be conjectured that the Creator must have provided for the preservation of the future generations of these animals by means of their eggs; and this, in reality, is the case. There are various conditions however that require to be fulfiled before this could be successfully accomplished. Not to advert, at present, to the wonderful but familiar continuance, of an egg containing the embryo of the future animal, a contrivance which shall afterward be considered, it is to be remarked that, in the present instance, the egg must be endued with the quality of preserving its principle of vitality for several months, in circumstances which would have proved fatal to the animal itself; that it must only produce the living creature when the wintry storms are past, and when those vegetable substances have begun to appear on which that creature can subsist; and that it must be so situated, and so endowed, as to be able, when animated, to find its way to the open air, and to its natural food. If any one of these conditions were wanting, it is sufficiently apparent that the species must perish.

Now, let us take an instance, and see what actually occurs. I select the case of the gipsey-moth which I abridge from the article Insect Transformations, in the "Library of Entertaining Knowledge." The female of this insect has her body thickly covered with a soft down, of a hair-brown colour, apparently for the express purpose of enabling her to protect her eggs during winter; and she follows the impulse of her nature, in a manner well worthy of notice. Having emerged from her pupa-case in the month of August, she enjoys life for a few days, and then prepared for the propagation of her species after which she quickly dies. She places herself on the trunk of an oak or elm, invariably with her head downward. Having made a bed or nest of down, by tearing it from her body, she lays an egg in it; and this egg being covered with adhesive gluten attaches around it all the hairs of the down with which it comes in contact, and also sticks to the bark of the tree, from its being pushed home. Proceeding in this manner, she continues for several hours adding to the mass; but she does not in general, finish the operation in less than two days, indulging in occasional rests. At intervals, she takes care to protect the eggs placed in the heap, which is made in a conical shape, with an exterior covering of the same down; and, it is not a little remarkable, that in the external coping, which is designed to keep out the winter rains, the hairs are carefully placed in a sloping direction, like the tiles on a house, or the pile of a well-brushed hat, pointing downward, toward the base of the cone. The eggs, which are deposited with so much care are destined to abide all the pitiless pelting of the storms of winter; for, although they are laid in the beginning of harvest, they are not hatched till the elm, which is to furnish food to the future caterpillar, comes into leaf in the following spring. This covering of down, from the manner in which it is tiled and brushed smooth by the mother moth, not only protects them from wet, but, being one of the best non-conductors, keeps them safe from the injury which they might sustain from severe cold, or what might be more fatal, from sudden alterations of heat and cold.

In the instance now detailed, there are some things worthy of particular notice; and, as it is a fair specimen of the wonderful instincts of insects with reference to the preservation of the species during winter, it may be proper to make a few remarks on the subject. Let it be observed, first, that in the previous states of the insect, whether as a caterpillar or a chrysalis, it had no power of propagating its species.—It is not till its last and most perfect stage that this faculty is bestowed: and it enters on that stage just in time to flutter awhile in the sunshine, and then to die before the cold of the waning year interrupts its enjoyments, withers the vegetables on which it feeds, and chills its delicate frame; and in time, too, to lay its eggs, that they may weather the coming storms of winter, which the parent could not endure, and be hatched when the breezes of spring begin to breathe softly, and nature again proceeds to scatter her stores of food. It cannot be here said, either that the insect dies from the inclemency of the season, or that the hatching of the eggs is retarded by the deficiency of warmth; for the season is still genial, when the former, having fulfilled the intentions of nature, ceases to exist, and months of weather not inferior to

the heat of spring, succeed the depositing of the latter.—It is no other than a wise Providential arrangement.

Another surprising feature of the instinct displayed by this moth (which however, so far from being peculiar to the species, is only an instance of a general faculty affecting almost the whole insect creation.) is the choice of the spot where she deposits her eggs. Her eggs, when hatched, are destined to produce caterpillars, whose peculiar food is to be found in the leaves of the oak or elm. From all the trees of the forest, she, therefore, selects one or other of these as the place for depositing her precious gift to a future year, although it is not from them that her own means of substetence are to be gathered, and, although, so far as we are able to judge, there is nothing in her condition, as a moth, which could lead to the preference.

We have already spoken of the remarkable manner in which the gipsey-moth protects her eggs from the weather; but it may be proper to make an observation or two on the eggs themselves, applicable generally to all insect eggs, which are exposed to the storms of winter. The glutinous matter by which the eggs are united, when protruded from the insect, and which is so necessary for preserving them in a mass, and for fixing them to the spot, is found, contrary to the nature of many similar substances, to be insoluble in water, and therefore incapable of being affected by the copious rains to which they are destined to be exposed. But this is not so remarkable as another fact, which has been proved by some severe tests, and which shows how admirably the constitution of these eggs is adapted to the season of winter.—Both Spallanzani and Hunter made experiments to ascertain the degree of cold which the eggs of insects were capable of enduring with u injury; and we subjoin the statement of the latter:—"I have exposed eggs to a more rigorous trial than the winter of 1709.* Those of several insects, and, among others the silk-worm; moth, and elm-butterfly, were enclosed in a glass vessel, and buried five hours in a mixture of ice and sal gum (*rock salt.*) The thermometer fell 6° below zero. In the middle of the following spring however caterpillars came from all the eggs, and at the same time as from those which had suffered no cold. In the following year I submitted them to an experiment still more hazardous. A mixture of ice and sal gum, with the fuming spirit of nitre (*nitrate of ammonia,*) reduced the thermometer 22° below zero,—that is, 21° lower than the cold of 1709. They were not injured, as I had evident proof by their being hatched."

It is indeed, a singular and unaccountable fact that the eggs of these insects are incapable of being frozen even by the intense cold now mentioned. Spallanzani discovered this, by crushing some of the n with the nail, when he found that their contents remained fluid: and he justly infers, that the included embryos remain equaly unfrozen. The final cause of this is easily understood; but the chemical property which resists so severe a trial, has not been ascertained.

The modes by which instinct has taught insects to preserve their eggs during winter, are very various. One of these I have already detailed; but, before leaving the subject there is another which, on account of its singularity, I cannot deny myself the pleasure of mentioning; I allude to the cochineal insects (*cocc dæ.*) so called from one of the species furnishing the well-known valuable dye-stuff. These little insects contrive to render their dead bodies useful to their future progeny, by protecting their eggs from the severity of the weather. They die in the act of incubation. Their eggs are deposited under their bodies, which become glued to the spot, and thus serve as a covering. In this state the dead insects appear on the bark of trees, like small warts of various forms. The mother is seldom larger than a peppercorn, yet the number of eggs which she lays amounts to several thousands. Some of them secrete a sort of white silky gum, very like gossimer, as the first bed of their eggs. Some naturalists have supposed this substance to be of the nature of the spider's web; but the author of "Insect Transformations" says he has ascertained it to be "precisely similar to the gluten which envelopes the eggs of most insects."

* The year 1709 is celebrated for its rigor, and its fatal effects on plants and animals. Fahrenheit's thermometer fell to one degree below zero, and yet the insects were as numerous in spring as ever.

Southern Cultivator.—Another quarto bearing the above title has been added to the list of agricultural publications, and though last, not least in size or value. It is published at Columbia, Tenn., semi-monthly, $2 00 per annum. D. Clayton, Editor.—*N. E. Cultivator.*

TERRACULTURAL.

MEMOIR TO CONGRESS ON THE BEET CULTURE.

To the honorable the Senate and House of Representatives of the United States of America in Congress assembled:

The memorial of Charles Lewis Fleischmann, a naturalized citizen of the United States,

RESPECTFULLY REPRESENTS:

The existence of crystallizable sugar in the beet-root was discovered by the German chemist Markgraf, in the year 1747. He communicated the result of his experiments to the Royal Academy of Sciences at Berlin; pointed out the importance which his discovery would have on agriculture and industry, and endeavored to bring it into practice; but at that time, the price of sugar being moderate, chemistry not advanced to modify the complicated operations, and the spirit of enterprise not sufficiently awakened to make it an object of speculation, the discovery remained without being put into practical use until the year 1796, (forty-nine years afterwards,) when Achard, another Prussian chemist, repeated the experiments of Markgraf, modified them, and erected the first manufactory at Kunnern, in Germany.

The results of Achard's manipulation created great sensation all over Europe, particularly in France, where the chemists re-examined the process of Achard, simplified it, and made it more practicable and profitable in its results.

These symplified manipulations were adopted by enthusiastic speculators, full of sanguine expectations, peculiar to the French character; but the results were not satisfactory, as the immensely large and costly manufactories we e partly established in places where the soil was not sufficiently productive, were fuel was scarce and high, the market distant, and the operations directed by men who had not the least idea of agriculture—a science necessarily connected with the manufacture of the beet-sugar—nor practical knowledge of an entirely new process, and a most imperfect apparatus. The consequence of these obstacles was a complete failure, which induced the opinion over the whole world, that the extraction of sugar from the beet, though correct in theory, was impracticable on a large scale.

This, however, was not the opinion of enlightened men; they saw the causes of failure in their true light, and endeavored to overcome and to correct them. The political events of 1812 accelerated the developement of this new branch of industry; the French Government, in want of a substitute for the colonial sugar, encouraged the manufacture of the beet-sugar, by establishing four large manufactories and teaching the best method of extraction.

In 1814, these manufactories were in full operation and flourishing, when the peace of Europe allowed the importation of the colonial sugar into France, causing a destructive shock to the manufacturers of indigenous sugar, which none but immense fortunes could endure, and created, again, the belief that the manufacture of the beet-sugar could never come in competition with the colonial.

This might have been the final catastrophe of the manufacture of the beet-sugar, had it not been for the efforts made to revive it again by some wealthy and enlightened manufacturers.

These efforts, however, did not arise entirely from the patriotic desire to promote the welfare of France, (as now pretended,) but partly to prevent the loss of immense capitals invested in buildings, apparatus, farms, &c. Moreover, the manufacturers knew there was yet five or six per cent. more to gain by an improved operation.

This it was that gave a new start to this favorite branch of industry; and chemistry, particularly adapted to improve the art and manufacture, assisted in simplifying the process, and discovered the mode of *reviving* animal charcoal so as to admit of its being repeatedly used, while the improved apparatus helped to economize labor and fuel; and all this, combined with a wonderful perseverance, reduced the expenses of the fabrication, and enabled the old establishments to continue in operation, even when the price of colonial sugar was very low. This created confidence and a rapid increase of establishments.

The cultivation of the beet has had the most beneficial influence on agriculture; as, in the last year more than eighty thousand acres of land were planted in beet, producing about one million of tons of this root; and, as generally rotations of four crops are adopted, it brought at least three million two hundred thousand acres of land under the highest cultivation.

The following table shows the rapid increase of the manufactories, and the quantity produced, in France.

		Beet-sugar.
In 1828 there were 103 manufactories, which produced		100,000 cwt.;
1831	200	220,000
1836	543	950,000
1837	600	1,000,000

Or 20,000 tons of beet sugar.

The manufacture of indigenous sugar did not affect the demand for colonial sugar, as the consumption continually increased until the year 1836, as appears by a table from the Journal of Commerce of 1836, viz:

In	Consump. of colon. sugar.	Con. of beet-sugar.
1825	61,255,232 fr.	4,00),000 fr.
1831	67,542,792	10,000,000
1832	62,669,638	15,000,000
1835	69,000,000	30,000,000

But, in the year 1836, France imported only 75,120 tons of colonial sugar—a diminution of 15,630 tons in one year; a *quantum* too large not to alarm the proprietors of the sugar plantations in the French colonies, and particularly in Martinique, who looked, some years ago, with an ironical smile at the beet-sugar manufacturer. They, who have ridiculed and caricatured every improvement in this branch of industry, felt themselves forced to send, in 1835, Baron de Cools, with the following proposition of the French Government, viz: demanding—

1. Diminution of the duties upon French colonial sugar of 50 per cent., and a proportional reduction of duties upon the foreign colonial sugar.

2. The permission to export the colonial sugar direct to a foreign market.

3. A careful examination and investigation how the French colonial and beet-sugar manufactories can be equally taxed.

The latest news from France states that the Government came, finally, to the conclusion of an equal taxation upon the indigenous and colonial sugar, as may be seen from the following extract from a New York paper, (Morning Courier and New York Enquirer of December 18, 1838,) dated

[By the Ville de Lyons.]

"*Paris, October* 30, 1838.

"A branch of industry, (the offspring of necessity under the empire.) the production of sugar from beet-root, has engaged much attention in France, and has been carried on with success, and to a vast extent. The natural consequence has been, that sugar the produce of the French colonies. which is burdened with a very large duty on importation into France, *was beaten out of the market.* Appeals were made by the *suffering colonists* of the Government, repeatedly, representing the distress into which they had fallen from this circumstance; the irremediable ruin that would necessarily fall upon them if the present tariff were maintained, and soliciting relief. After a variety of expedients to evade a decision on the point, the Government has just come to the resolution of proposing to the Chambers, (which are to meet on the 24th December,) to reduce the import duty on colonial sugar by 8½ francs per cwt., which with a precisely similar excise duty levied on the beet-root, or home-grown sugar, will they say, suffice to reopen the market to the colonies.

Such is the state and results of the indigenous sugar manufacture in France.

What is the progress of this branch of industry in the other parts of Europe?

England (the mother of colonies,) which was very much prejudiced against the manufactnre of indigenous sugar, seems to see, in the adoption of it, the only means of improving the physical and moral condition of man in her colonies; and she has already overcome some of her prejudices, and has begun to establish manufactories. The following article, taken from the London Mechanics' Magazine of 1836, (No. 169,) will show its progress.

"A refinery of sugar from the beet-root is being erected at Thames bank, Chelsea, which, it is expected, will be in operation in about six weeks. In the vicinity of the metropolis, during the past summer, a great many acres of land have been put into cultivation with the root at Wandworth and other places. The machinery will be principally on the plans of the vacuum-pans, and *a pure refined sugar* will be produced from the *juice* by the *first process of evaporation* after it has simply undergone the process of discolorization. Another part of the premises is appropriated to the manufacture of coarse brown paper from the refuse, for which it is extensively used in France. In case the Government do not interfere, and by rendering the product excisable, retard or prohibit its manufacture, several individuals have it in contemplation to establish refineries in different parts of the kingdom for purifying sugar, which may be produced in agricultural districts for domestic or foreign use. A refinery has lately been established at Belfast, in the vicinity of which town upwards of two hundred acres of land have been put in cultivation with the beet-root for the manufacture of sugar."

Russia, which adopts every useful improvement in manufacture, has, in the southern departments, large manufactories of beet-sugar, by which she expects to furnish some of the Asiatic markets with this article. So have Bohemia, Hungary, Austria, and Switzerland large beet-sugar manufactories, in the most flourishing condition.

The Germans, though the discoverers of the crystallizable sugar in the beet-root, until 1836 made very little progress in its manufacture. This is to be ascribed as well to the continual war with France, which checked every improvement as to the uncertainty of the business itself. The Germans, well aware and well informed of every improvement made abroad, never found it sufficiently lucrative to embark in it; but it seems that this nation, which has given the world so many great and important discoveries, was destined to bring its own discovery of the extraction of the sugar from the beet to perfection. This was accomplished by Mr. Schuetzenbach, of the Grand Ducy of Baden. Schuetzenbach re examined carefully Markgraft's experiments, and found that the first experiment of this great chemist, made eighty-nine years ago; is the best method, when modified, to produce, with less labor and expense, eight pounds of white refined sugar out of one hundred pounds of the raw beet-root. This improvement it is which will, in a short space of time, exclude all the colonial sugar from the European market, as well as our own. This improvement also, will change the condition of millions of men in the colonies.

The opinion and judgement of a nation, jealous of every discovery or improvement made in other countries, and especially in this branch of industry, in which it has sacrificed millions of francs for its perfection, will serve as a proof of the importance of the new improvement. These new discoveries are detailed in an article which appeared in the *Journal des Debats Politiques et Literaires*, in Paris, dated the 16th July, 1838, Michel Chevalier, viz:

"It would seem that the spirit which was manifested in the days of the Revoluti n, has been transferred from the political arena, and is exerting itself in that of industry. At this time the manufacture of sugar from beets is on the point of undergoing a metamorphosis which, as it appears, will change all the condition of its existence, and extend its influence, not only to the consumption, but also to the production of that article.

Until now a series of operations has been applied to the extraction of sugar from the beet, which, though simple enough in appearance, are in reality complicated and delicate; which demand not only a great number of intelligent and skilful workmen, but also require considerable material to be operated upon; and which, again, consume costly articles, such as milk, blood, animal charcoal, &c.

"In the former process the sugar-beet was scraped; the pulp pressed by means of an hydraulic press. The juice so obtained underwent defecation, or the separation of the albuminous and mucilaginous elements, and then the clarification and evaporation. Once concentrated, the sirup underwent crystallization, which furnished the raw sugar; and this then had to be refined before it could be admitted on our tables.

"Since its origin the process of extracting the sugar has always been the main point, but it has been modified and improved in the details: so much so, that our manufacturers who were ruining themselves when the sugar was at six francs the pound, are becoming rich at the low price of 20 sous per pound. At this time the scraping, pressing, defecation, clarifying, and evaporating were attended with difficulties, which it required a great length of time to subdue. The loss in manufacturing was enormous, as only from three to five parts of sugar were obtained from a hundred pounds which are contained in the root.

"With the assistance of chemical analysis, it was ascertained that this evil proceeded from the presence of a certain quantity of acid of divers coloring, mucilaginous, and gelatinous matters suspended in the juice. The presence of these mischievous substances injures the sugar, prevents it from crystallizing, sometimes destroys it, and causes it to yield only poor molasses. To prevent these injurious effects, different agents have been used, which were found more or less efficacious. Apparatus was constructed, which accelerated the manufacture, and diminished the time during which the sugar is in contact with these injurious substances; but the inquiry was never made whether it were possible to separate the sugar from those foreign bodies, or at least to neutralize or paralyze their destructive power, before the juice is extracted.

"The new process, first alluded to, was discovered in the grand duchy of Baden, by Mr. Schuetzenbache, of Carlsruhe. The experiments introduced a method of manufacturing sugar which was adopted by several manufacturers on the right bank of the Rhine, and which is already in vigorous operation.

"Like all ideas which are destined to accomplish revolutions in manufactures, as well as in politics, that which serves as basis to the new process is simple. The operation of drying the beets immediately after they are taken from the field, is now the first step in the process. By this operation, the mucilaginous matter, which is an integral part of the beet, loses the property of dissolving in water; this drying stops also the fermentation which takes place during the preservation of the beets in cellars or in the heap, and likewise prevents the formation of acids, which were created at the expense of the sugar, and which embarrassed the manufacture of beet-sugar.

"When the beet are once dried, the sugar is easily obtained by mixing them with a small quantity of water, which produces a solution of sugar and a very small portion of other bodies, and which, by the process of evaporation, gives at once a good product, which can be easily refined.

"In a word, the elementary operation of the desiccation acts with the power of exorcism; it drives from the juice all injurious substances which were the former causes of evil in this manufacture.

"This fact being once understood, and duly verified by experiments on a large scale, it was then important to bring it to perfection by an easy practical manipulation. This is what the '*Societe d' Encouragement*' is about to undertake, and that with every chance of complete success. This is already much more than mere expectation, because the problems which it has proposed are already more than half solved, and the entire solution of them is scarcely a matter of doubt: so that the manufacture of the sugar from beets is about to be built on a new basis.

"The '*Societe d' Encouragement*' have offered the following prizes for the promotion of this manufactnre:

"1. One of 4000 francs for the best process for the desiccation of the beets.

"2. One of 4,000 francs for the best treatment of the dried beet for the extraction of the raw sugar.

"3. One of 4,000 francs for the conversion of the raw into refined sugar, without taking it out of the mould.

"4. One of 3,000 francs for an analysis of the beet root, &c.

"5. One of 3,000 francs for the invention of a saccharometer, which should be so constructed as to be easily applied, and to have the property of showing immediately the quantity of crystalizable sugar contained in the fluid under trial. A contrivance of this kind, which would be a sure guide for the farmer, and for the workman in manufactories, indicating to the former the proper time to collect his crop of beets, and to the latter how to manage his operations, would be of immense value.

"When these five prizes are gained, the theoretical and practical renovation of the manufacture of beet-sugar will be radically accomplished in all its forms.

"To the question, *Will* this be affected? it may be safely answered, that existing facts scarcely allow of the expression of a doubt that such will be the case.

"The problem of the complete and rapid desiccation by, an economical process has presented very formidable difficulties. *This drying may be denominated the* CORNER-STONE *of the new system;* but this problem is far from being insolvable; on the contrary, it ought to be regarded as solved.

"In one of the last sessions of the *Societe d' Encouragement*, Mr. Beyrand, of Marseilles, presented beets cut in slices, which were dried in eight minutes by the combined action of pressure and heat, effected by two cylinders, heated to 100 degrees by steam. This result will appear more prodigious when we consider that 100 parts of beets contain 84 parts of water.

"The beets, prepared after Mr. Beyrand's method, preserve all their sweetness. Mr. Schuetzenbach, of Baden, dries the beets by a slow process, probably less perfect than Mr. Beyrand's method; but the result is already excellent, and favors the application on a large scale. In the manufacture of Mr. Scheutzenbach, the beets are cut in small thin slices, and, as soon as they come in contact with the air, they bend and roll up, and lose the property of sticking together, which gives the hot air of a kiln (to which they are brought immediately after they are cut) a free circulation in all directions round them. The temperature of these kilns is from 20 to 40 degrees Reaumur, (from 99.5 to 122 degrees Fahrenheit.)

"Mr. Schuetzenbach's apparatus of desiccation is very economical. The machine for cutting the beets cost only from 400 to 500 francs, and

half a horse power is sufficient to put it in operation. Such a machine, when at work every day for three months will cut one million killogrammes of beets, (about 1,000 tons,) which would be a sufficient supply for a large manufactory. A kiln, about 10 feet by 9, and 9 feet high, dries, in 24 hours, 3,000 pounds of beets, and consumes only 420 pounds of charcoal. Three such kilns would be sufficient to dry all the beets cut by one machine during twelve hours.

"In the manufactory of Mr. Schuetzenbach the dry beets are reduced to a coarse powder, sprinkled over with lime, and stored away in casks.—When the sugar is to be extracted, this coarse powder is mixed with water, which produces a liquor marking 21 degrees on the saccharometer; and when evaporated with Roth's apparatus, this liquor yields, without any other preparation at the first crystallization, a raw sugar, known in commerce by the name of *bonne quatrieme*, which, after a second crystallization, becomes a *bonne commune*. The advantage of this new method is such, that the beets raised at Esslingen, in Germany, in 1837, (less rich in sugar than the preceding year,) yielded more than eight per ct. of crystallizable sugar, instead of five, which was the highest product by the old process; and, in the proportion as the gain on sugar increases, the expense decreases; so much so, that eight pounds, now obtained, costs less than formerly four or five from 100 pounds of beets.

"Two important points are then attained: *first*, how to dry the beet; and *second*, how to extract the sugar from it.

"To refine the raw sugar, without taking it out from the moulds in which the syrup was placed to crystallize, and which always causes the loss of a considerable quantity of sugar appears to be a question equally advanced. Recent experiments, on a large scale, show that raw sugar washed in moulds, with pressure, gives, in the short space of three days, a perfect refined article, which formerly required from two to three weeks to effect.

"In regard to the analysis of the beet in its diverse states of maturity, nothing has yet been attempted; but this is a task which chemists can at any time accomplish, and the prize held out for it will induce many a chemist to undertake it; and it will not be long before we know to what extent the constituent parts of the sugar-beet develope themselves simultaneously, and which is the most favorable moment for collecting them for the manufacture of sugar.

"In regard to an exact saccharometer, of a simple and practical construction, with the aid of which all manufactures can ascertain to a fiftieth part, the richness of the saccharine matter in beets, and of all other substances cantaining crystallizable sugar, the learned researches of a young chemist, M. Peligot, promises great success.—Lime and baryte, have that property to combine with crystallizable sugar, and form together an insolvable composition, in which, nevertheless, the sugar does not alter, and is easily seperated from it. In bringing this fact to a simple mechanical operation, no doubt is left that the quantity of sugar contained in beet syrup can be ascertained with the greatest nicety.

"The problems proposed by the *Societe d' Encouragement* are at this time almost solved. It does not any longer propose to discover a new method, but only to perfect the processes which are already verified, by an application on a large scale. Among the advantages which are derived from the renovation of the manufacture of the beet-sugar, is the extension of the culture of the beet-root; because it will be easy for every farmer to send his dry produce to any market, far or near, as the weight of the raw beet is reduced, by the process of desiccation, to less than one-sixth part. The beet can now be raised anywhere, however distant from the manufactory; and, reciprocally, it is impossible to establish manufactories in all parts of France, to concentrate them in such places where fuel is plenty and at a low price; whereas, at present, the manufacture is only possible close to a field fertile enough to produce beets. Another important fact: 1,000 pounds of beets contain 100 pounds of sugar. The price of beets is about 12 francs; the expense of drying and extracting the sugar would not exceed 10 francs, (this is sufficiently proved by experiments;) making the total amount 22 francs. Suppose that one-tenth of the sugar is lost, the manufacturer would have 90 pounds of sugar for 22 francs, or 100 pounds for less than 25 francs. Allowing for small expenses, &c., 50 per cent., the sugar (the refined sugar of this country) could be delivered to the consumer for 38 centimes, (or 7½ cts.) per pound.

"This will create a revolution in the consumption of sugar, as well as in the division of the branches of industry, over the whole globe; then instead of importing sugar from the southern regions, it will be left for us to furnish them.

"MICHEL CHEVALIER."

To be Continued.

GAY'S SILK MACHINERY.

We copy with pleasure the following notice of the machinery of this accomplished machinist, and hope he will find in the American people not only the gratitude to acknowledge his strong claims upon their patronage, but enterprize sufficient to reward him for the toils he encountered, and the skill and ingenuity displayed in perfecting his machinery.

From the Baltimore Patriot.

MR. GAY'S SILK MACHINERY

Mr. Editor: There can be no doubt, but that the culture of Silk is destined soon to become one of the most profitable branches of national industry. Enquiry is aroused and interest awakened. A spirit of earnest adventure has gone forth among the people, and nothing now, short of another revolution, can put it down. Its march is onward.

We have every advantage, both as to the culture and manufacture of Silk. The soil and climate, of the great number of our States, are as well adapted as those of any country on the globe.

We have already made the attempt and succeeded, both in the culture and manufacture. Mr. Gay exhibited to me, in the State of Delaware, some wove silk for ladies' dresses, and some handkerchiefs, as beautiful as any that ever came from the looms of China, Italy or France. In solidity they are superior to almost any of the imported article.

Mr. Gay, the ingenious inventor of the silk machinery exhibited in this city, is, I have been told, originally from Connecticut, the land of industry and ingenuity, and richly deserves, with some other States, to be styled the *Universal Yankee Nation*. Mr. Gay was a pioneer in the silk buisness, and with slender means he early applied himself to the study of the silk culture, and to the perfection of silk machinery. After hard struggling, he put in operation the discoveries and improvements he had made, and has now given to the world his machines for unwinding or reeling cocoons, and for making sewing silk. I have seen this machinery operate, and pronounce it, as far as my judgement goes, almost perfect. It is as simple as it can be to act properly, and yet it has every thing necessary. The traversing bar of the machine which unwinds the cocoons, is moved by a simple groove in a wheel, whereas in the Piedmontese reel, two or three wheels are required to move the bar. Mr. Gay's machine saves a vast deal of trouble. Instead of taking the silk from the cocoons to the reel, and then from the reel to the spools, this machine takes it immediately from the cocoons to the spools, thereby saving more than half the trouble and time. In his machine which doubles and twists the thread, I noticed a peculiar wheel, intended to lower and elevate alternately the spindles, so as to spread the silk on the spools. It is in the shape of a heart, and I am told that a wheel of no other shape would answer, which from my knowledge of the science of Mechanics, I know to be true. Mr. Gay has discovered a substance, that when put on the silk, will render it compact and prevent the fibres from seperating when running over a surface, and from sticking to a reel.

The machinery of Mr. Gay has been exhibited and admired in Connecticut, Rhode Island, New York, Pennsylvania, and elsewhere. It is now operating in several of those States. I am told that Mr. Gay has received orders for his machinery in the District of Columbia from several persons.

Farmers come forward! With Mr. Gay's machinery your daughters in a few days, nay in a few hours, may learn to make as good sewing silk as any from Italy, and sewing silk is worth from ten to twelve dollars per pound. Farmers, come forth like men, and the poor worn out fields around you, will yield silver and gold as pure as those you now cultivate with so much toil and expense in corn. Put those old fields in Mulberry, and with Mr. Gay,s machinery you may reap in three months, far more than you do in the whole year, and this may be done by your daughters and small children. They may walk in purple and fine silk; and that too of their own manufacture, for in these machines of Mr. Gay, you may twist it ready for your loom. By the by, I had forgotten to mention that Mr. Gay was the man who applied the Power Loom to weaving silk, a thing which was declared to be impossible. Without flattery, I believe he has done, and is now doing, more for the silk cause in our country than any other man. In his experiments and improvements he stops not at expense. I have understood, that he has expended fifteen thousand dollars in bringing his machinery to its present state. May his exertions for the public good be richly rewarded, and unlike the inventor of the Cotton Gin, may he never want a penny. How vast is the benefit derived from one machine like the Cotton Gin, or Mr. Gay's Silk Winder and twister! The people are not aware how much they are indebted to such men as Gay and Whitney. Their monuments may truly be said to be more lasting than brass or marble—they must endure while industry has a name or society exists.

EXAMINER.